

What is claimed is:

- 1 1. An apparatus for use in predicting exchanges of a specific quantity of
2 communication traffic between network elements, said apparatus comprising:
3 a digital processor operable on a periodic basis to calculate a weighted traffic flow
4 per usage for a given network element, said digital processor further including,
5 a comparison mechanism for comparing a value of said weighted traffic flow per
6 usage with a remainder value of said specific quantity of communications traffic yet to be
7 processed by said network element, wherein an indication is given by said network
8 element if said remainder value is less than said weighted traffic flow.

- 1 2. The apparatus of Claim 1, wherein said digital processor waits until
2 beginning another time period to calculate another value of said weighted traffic flow per
3 usage to be compared with an updated remainder value.

- 1 3. The apparatus of Claim 1, wherein said specific quantity of
2 communications traffic corresponds to a quantity value associated with a security
3 association (SA) between said network elements.

- 1 4. The apparatus of Claim 3, wherein said indication given from said
2 network elements prompts renegotiation of another SA.

- 1 5. The apparatus of Claim 3, wherein said SA is an Internet Protocol Security
2 (IPSEC) SA.

- 1 6. The apparatus of Claim 1, wherein said apparatus is used in connection
2 with a communications traffic monitoring application to identify randomly occurring
3 traffic patterns.

- 1 7. The apparatus of Claim 1, wherein said apparatus is used in connection
2 with a communications network management application to monitor usage of network
3 components.

1 8. The apparatus of Claim 1, wherein said weighted traffic flow per usage
2 corresponds to the average use of network element per period multiplied by the average
3 communications traffic quantity per use.

1 9. A method of predicting exchanges of a specific quantity of communication
2 traffic between network elements, said method comprising:

3 calculating on a periodic basis a weighted traffic flow per usage for a given
4 network element;

5 comparing a value of said weighted traffic flow per usage with a remainder value
6 of said specific quantity of communications traffic yet to be processed by said network
7 element; and

8 giving an indication from said network element if said remainder value is less
9 than said weighted traffic flow.

1 10. The method of Claim 9, further including waiting until beginning another
2 time period to calculate another value of said weighted traffic flow per usage to be
3 compared with an updated remainder value..

1 11. The method of Claim 9, wherein said specific quantity of communications
2 traffic corresponds to a quantity value associated with a security association (SA)
3 between said network elements.

1 12. The method of Claim 11, wherein said indication given from said network
2 elements prompts renegotiation of another SA.

1 13. The method of Claim 11, wherein said SA is an Internet Protocol Security
2 (IPSEC) SA.

1 14. The method of Claim 1, wherein said method is used in connection with a
2 communications traffic monitoring application to identify randomly occurring traffic
3 patterns.

1 15. The method of Claim 9, wherein said method is used in connection with a
2 communications network management application to monitor usage of network
3 components.

1 16. The method of Claim 9, wherein said weighted traffic flow per usage
2 corresponds to the average use of network element per period multiplied by the average
3 communications traffic quantity per use.

1 17. The method of Claim 9, wherein at least a portion of said communications
2 traffic flows between network elements over the public Internet.

1 18. A method of predicting expiration of quantity based security associations
2 between network elements, at least a portion of communications traffic exchanged
3 between said network flowing over the public Internet, said method comprising:

4 calculating on a periodic basis a weighted traffic flow per usage for a given
5 network element;

6 comparing a value of said weighted traffic flow per usage with a remainder value
7 of yet to be processed communications traffic of one of said quantity based security
8 associations; and

9 renegotiating another security association with a corresponding one of said
10 network elements if said remainder value is less than said weighted traffic flow.

1 19. The method of Claim 18, wherein said weighted traffic flow per usage
2 corresponds to the average use of a security association per period multiplied by the
3 average number of bytes processed per use.

1 20. The method of Claim 18, wherein said security association is an IPSEC
2 security association.